User Manual

GE-132 PH/ORP Controller

The initial password： 8006

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1 Overview

pH／ORP meter is a microprocessor-controlled intelligent online water quality monitoring instrument, the configuration of different types of pH (or ORP) electrode, the pH of the aqueous solution or ORP and temperature values for continuous monitoring and control.

2 The structure features

Complete measuring system consists of GE-132 type controller and the pH (or ORP) electrode composed of two parts, pH (or ORP) electrode contact with the measured solution, the meter displays the solution pH (or ORP) and temperature values, and work status.

3 Technique features

（1）Measuring range：pH：0.01～14.00pH； ORP：－1999～＋1999mV；

Temperature：-5～110.0℃；

（2）Resolution：pH：0.01pH；ORP：1mV；

（3）Basic error：pH：±0.1pH；ORP：±5mV；Temperature：±0.5℃；

（4）The temperature compensation range：0～110℃；

（5）The stability： pH:≤0.02pH/24h；ORP:≤2mV/24h；

（6）Current output：0～10mA(load resistance＜1.5KΩ)；

4～20mA(load resistance＜750Ω)；

（7）Two group of alarm relay：3A 240VAC，6A 28VDC or 120VAC；

（8）power supply：220VAC±10%,50±1Hz，power consumption≤3W；

Or 24VDC，power consumption≤1W；

Or 12VDC，power consumption≤1W；

（9）The dimension：96×96×130mm；

（10）Installation way：panel installation；

The tapping size of electronic unit ：91×91mm；

（11）Waterproof Wall Box Size：300(H)*200（W）*167（D）mm；

（12）The electronic unit weight：0.6kg；

（13） Operating conditions：a)Ambient temperature ：－10～60℃;b)Relative humidity：no bigger than 90%；c)There are no corrosive gas around； d)There are no other magnetic fields or electromagnetic fields which produce the negative effect except the earth magnetic field.

4 The function features

⊙ Intelligence: complete single-chip microprocessor pH (or ORP) value measurement, temperature measurement and compensation;

⊙ Dual high impedance preamplifier: high input impedance, noise, anti-jamming;

⊙ Point calibration and two-point calibration and calibration of three kinds of known concentration calibration mode;

⊙ Man-machine dialogue: the menu operation structure, the user can follow the onscreen prompts action;

⊙ With multi-parameter display: Simultaneous display of pH (or ORP) values, temperature and working conditions;

⊙ Software to set output: 0 ~ 10mA or software selection 4 ~ 20mA output;

⊙ Range and alarm, free to set lower limits; upper and lower limit alarm prompts;

⊙ Two relay control switch, volume control adjustable hysteresis;

⊙ Since the password: The user can set or modify the password, so access to the result of misuse;

⊙ Service: To provide technical support and after-sales service contact methods;

5 The installation of meter

5.1 The controller shall be installed where it is clean, dry and well-ventilated and there is no vibration, no corrosive gas or steam. Some space shall be left around the meter，for the convenience of the operation and overhaul. The meter shall be as close as possible to the sampling point，for ease of pipe and electric connection. The meter shall be close to the sensor for the ease of calibration. See the diagram 1 for size: 91mm * 91mm.
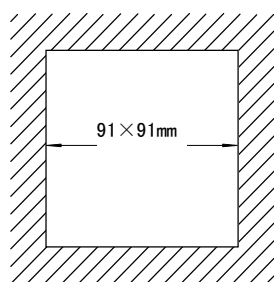

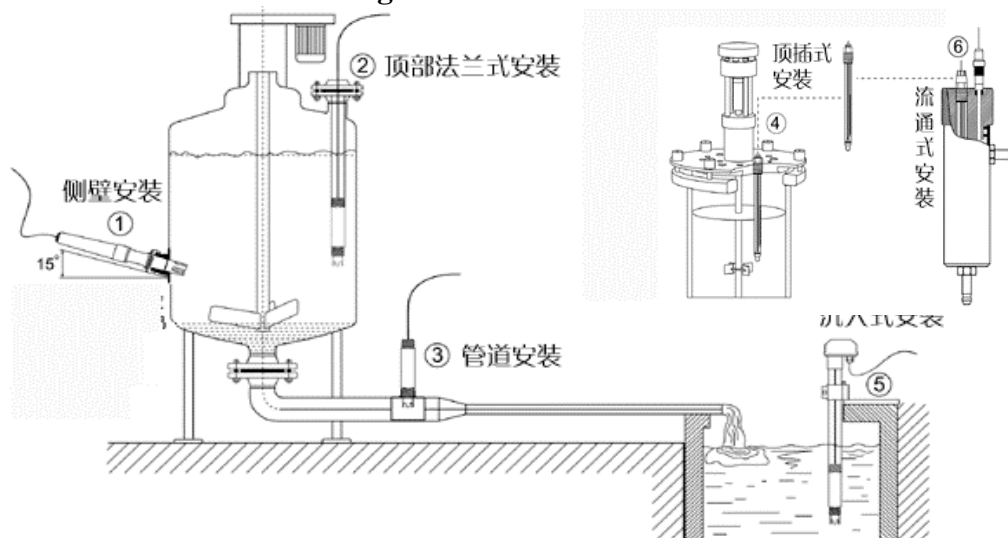**Figure 1 hole-tapping size**

5.2 Electrode installation diagram

Figure 2   a variety of installation shown in Figure

①parietal install
②top flange install
③tube install
④top plug install
⑤sink-in install
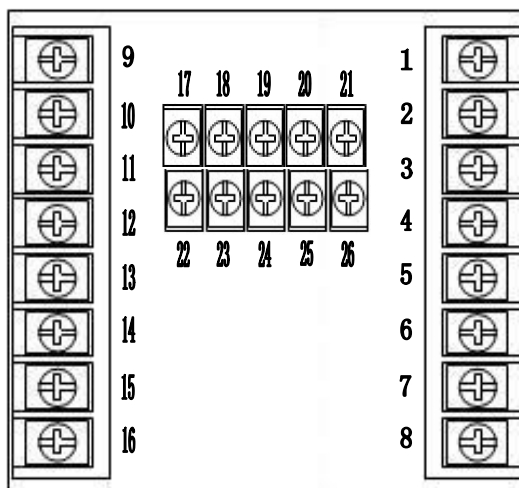⑥flow-through install

5.3 The electric connection

Figure 3 instrument wiring diagram

Wiring instructions:

9、pH measuring electrode terminal   1、High alarm relay normally closed contact

10、pH reference electrode terminal   2、High alarm relay contact common

11、Temperature electrode terminals   3、High alarm relay normally open contact

12、Temperature electrode terminals   4、Low alarm relay normally closed contact

13、Shield terminal   5、Low alarm relay contact common

14、Null   6、Low alarm relay normally open contact

15、pH output current－   7、220VAC or 24VDC＋ or 12VDC＋

16、pH output current＋   8、Zero line or 24VDC－ or 12VDC－

17、～26、Null

5.4 Electrodes filxed conventional cable length is 5m lead, Terminals Department has labeled inserts with insert it into the controller back the same number of terminal symbols can be tightened.

6 Function Keys

The panel has 6 touch key and they are：Esc 、←、→、↑、↓and Enter .

Esc：shift between the measurement screen and menu screen or return to the previous menu and status from the menu screen or cancel the input data；

←：move to the first menu item or move the cursor to the left when the data is input；

→：move to the last menu item or move the cursor to the right when the data is input；

↑：move the menu upward or numerical value increases；

↓：move the menu downward or numerical value decreases；

Enter：Choose or confirm the menu item and finish the data input or confirm certain status.

7 Detailed instructions

7.1 Power-on：Before the meter is used, check all the pipe connection and the electric connection. After the power supply is connected, the meter displays as shown in below left, In over serval seconds, meter will enter into measurement main display.

pH main display

Welcome

9.50 pH

Normal

20.0 ℃
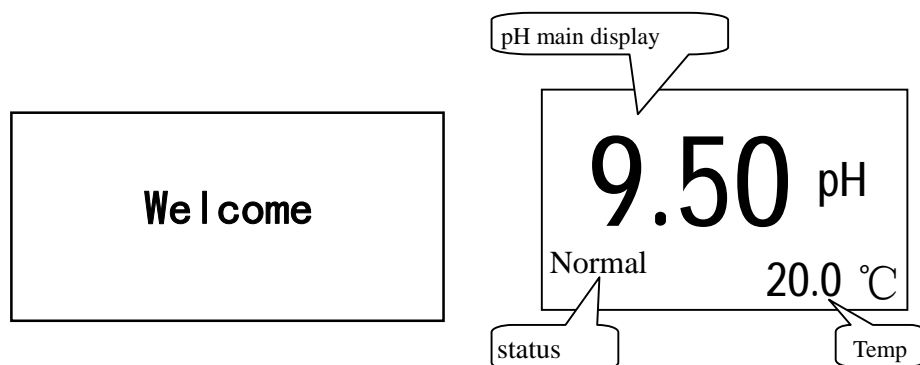
status

Temp

The pH content is main display, temperature and status is subsidiary content. The status line display below information: normal, high alarm, low alarm, temp.

7.2 Main menu: While in the main display status, press ESC key will enter main menu. It display like below:

Main menu
1.parameters
2.sensor calibrate
3.check and set
4.after service
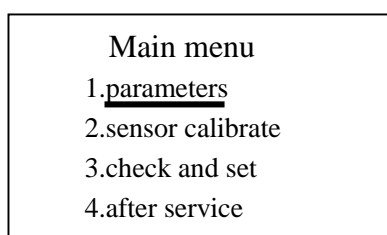
7.3 The submenu "parameters": All the parameters under the submenu should be checked before measuring, otherwise it will run by the preset values. Move the cursor to the "1.parameters" submenu and press ENTER key, a password will be requested(preset password is 8006). When enter this submenu, using ↑ or ↓ key move the cursor, press ENTER key to modify the sub parameters.

| 1st | Disp Type：pH
HighAlarm：14.00pH
Lowalarm：0.00pH
Dead Band：0.00pH
CurMethod：4-20mA |

⇩ → Use the following keys one by one move, or use the left and right full-screen look.

| 2st | Out.High：14.00pH
Out.Low：0.00pH
SensorZero：0.0mV
Sen Slope：1.000
StantionID：00 |

⇩ → Use the following keys one by one move, or use the left and right full-screen look.

| 3st | Temp.Mode：actual
Man.temp：25.00℃
pH Convert：Off
ConvSlope：0.0260pH/℃ |

7.4 Parameter Description

1）"Disp Type"： set the meter into pH display mode or ORP mode.

2）"High Alarm" and "Low Alarm" and "Dead Band":The three used to set the high and low alarm limits, alarm high limit> lower limit alarm; and can be set to control the amount of dead band.

3）The "output current(CurMethod)"

This menu is used to setting the meter current output method. Make the selection between "0-10mA" and "4-20mA". The relationship between the output current　and the measured dissolved oxygen：

0～10m A output method ： $I=\{(D-DL)/(DH-DL)\} \times 10mA$；

4～20m A output method ： $I=4mA+\{(D-DL)/(DH-DL)\} \times 16mA$。

Among them：I-output current，D-the currently measured dissolved oxygen，DH- the "output upper limit " set by users；DL- the "output lower limit " set by users。

4） "Out.High"and"Out.Low":These two used to set the current output value corresponding to the range of chlorine, the output limit> output lower limit.

5）The "SensorZero" and "Sen.Slope"

The "SensorZero" and "Sen.Slope" are respectively used to set the electrode zero point potential and set the electrode slope ratio. This function is mainly used to directly input its zero point potential and slope ratio when the new electrode calibrated by the lab is used in exchange for the old one.

6）"Temp.Mode"and"Man.Temp":"Temperature mode" points "actual"and "mannual"

" actual "refers to the actual temperature is measured by the temperature sensor's; " mannual "means the temperature is artificially set, and the actual solution is independent of temperature.

7）"pH Convert"and"ConvSlope"：This function is used for special occasions, usually does not work.

7.5"Calibration"：As each pH electrode, the zero level is different, the pH electrode on the conversion coefficient (the slope S) can not accurately reach the theoretical value, and zero in the course of the electrode potential and the slope will continue to change, resulting in aging , which requires a regular basis by measuring the standard buffer solution to obtain the actual electrode potential E0 and zero slope S, that is a "calibration." This little instrument calibration and two-point calibration and calibration of three methods of known concentration for the user to choose. Recommended two-point calibration method.

Point calibration：Using a standard calibration buffer solution on the electrode, the electrode, the zero level calibration only. Measurement accuracy is not required in the case of using this method to streamline operations. Selection of the measured water pH and close to the buffer solution as a calibration standard solution, calibrated before the Rinse measuring cup 2 times. Then the bottom electrode with a clean filter paper to dry the water droplets gently (do not use filter paper to wipe the electrode, the electrode in order to avoid static electricity, resulting in erratic readings). The standard buffer solution into the measuring cup, insert the electrodes. Select the standard solution (see below left) and press the "Enter" key to continue.

Please select the standard solution 9.18 6.86 4.00 pH	Result: $E_0=0.50$ mV Press Enter to save

Wait a few minutes to complete calibration is automatically (or manually click "Enter"), shows results of calibration reference value E0 above right (above data for reference, not as the actual use of calibration data). Click "Enter" button to save data and press "Esc", the user to make judgments, to see whether measured by the standard solution as the actual, specific value to the user's own site on the measurement accuracy according to the specific requirements identified. Calibration results are

automatically stored in the "Parameters", you can query to "E0 and S values." Calibration is completed, the electrode is installed, connected to water samples can be measured.

Two-point calibration (recommended)：Choose from three standard buffer solution 4.00pH, 6.86pH, 9.18pH two of them on the electrode calibration. Before calibration the electrode in the solution can be activated to ensure the calibration values and the values of stability and precise monitoring. Two-point calibration and calibration process that is similar to a standard solution only after complete calibration standard solution of two calibration process. Two-point calibration, the first calibration 6.86pH, after calibration 4.00pH or 9.18pH. Calibration results: glass electrode S ≥ 0.90 for qualified, antimony metal electrode material is qualified S ≥ 0.80.

Known concentration calibration: about to enter a known pH value after calibration.

PH standard buffer solution on the configuration instructions: Configuring the water quality standard buffer solution, please use distilled water (normal drinking distilled water), free to use the general configuration of the water quality standard buffer solution is not accurate, the calibration of the electrode will have a huge impact . Bag of pH standard buffer solution can be configured to 250mL, just pour a little used to soak the pH electrode bulb capacity to other sealed to prevent the dark place please save for later calibration use.
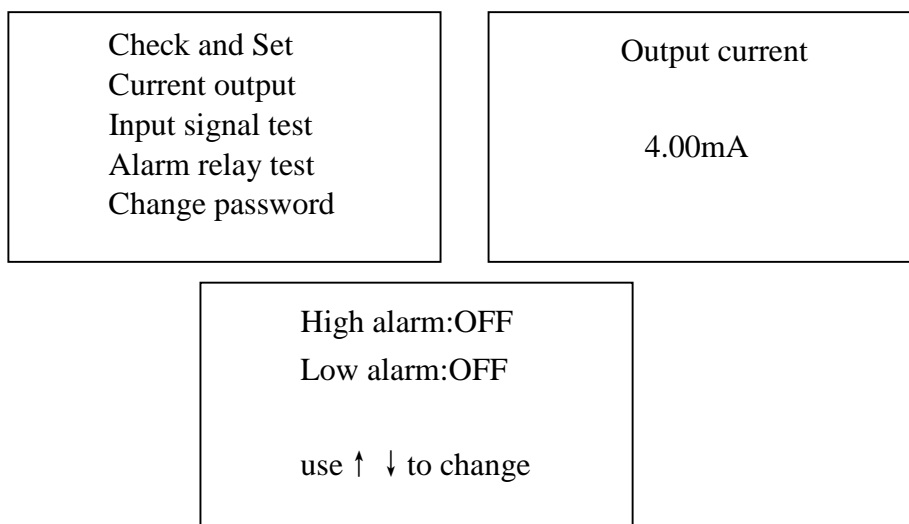
8 The submenu "check and set"

8.1"Current output":

This function is mainly used for the correct checking of output current, and with this submenu, the user can check the correctness of meter output current within the full output range. When the meter is connected with the recorder and traditional slave machine, check whether the recorder and slave machine sampling are correct or not, so as to detect the fault.

Input the password before entering the submenu. Afterwards one warning will appear, informing the users that they should guarantee any change in the output current will not bring any negative effect before they use the meter. Press Enter key to continue. There will display the present output current on the screen. Press ← → ↑ and ↓ keys to change the output current, Press Enter to stop the changing. Press Enter again to input the output current what you need.

Notes：When this function is used，the output current is set by the user and it will change within the full range, guarantee that the adjustable regulator connected on the output circuit or microcomputer will not produce any negative effect upon the control output.

```
┌─────────────────────────┐    ┌─────────────────────────┐
│   Check and Set         │    │     Output current      │
│   Current output        │    │                         │
│   Input signal test     │    │       4.00mA            │
│   Alarm relay test      │    │                         │
│   Change password       │    │                         │
└─────────────────────────┘    └─────────────────────────┘
```

```
┌─────────────────────────┐
│   High alarm:OFF        │
│   Low alarm:OFF         │
│                         │
│                         │
│   use ↑ ↓ to change     │
│                         │
└─────────────────────────┘
```

8.2"Alarm relay test":Into the book menu display as shown above.This function is used for testing the alarm relay output.

Load control relay rated current is less than the exposure to current, pressing the left to connect (power supply not more than 220V);

Load control relay rated current greater than the exposure to current, then the need to add AC contactor, press the connect at right.
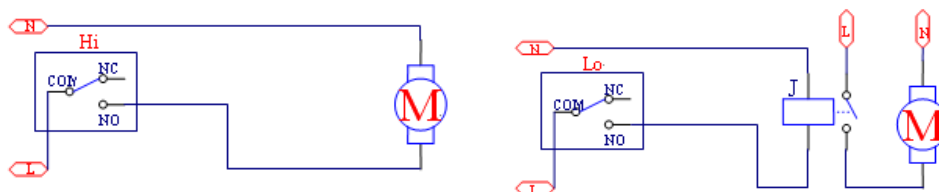
8.3"Change password":After entering this function, input "initial password "(initial password is 8006), and then input "new password" complete the modification of user password.

8. 4**"Input signal test"**: This function is mainly used for simulated debugging by the meter factory.

8. 5**"After Service"**: This menu shows the after-sales service telephone number, E-mail and Web address.

9 Daily maintenance

Instruments generally do not need routine maintenance, such as failure to contact the company, the company's technical staff under the direction of the adjusting.

pH electrode maintenance, please note the following:

（1）Using flow-through structure as possible into the water sample flow rate constant.

（2）Factory, the electrode head has a protective cap, electrode within the soaking, in order to maintain sensitive membranes moist. Off the protective cap before use, when

not in use to protect the screw cap.

（3）New electrode soaking in 3.3mKCL concentration soak a day and night to ensure calibration accuracy.

（4）Calibration is recommended that you install. When installing the measuring cell composite electrodes can not crash the glass bulb to avoid damage.

（5）When the scene a long time without water instead, it is timely twist on the electrode protection cap, protection cap into the soaking concentration of 3.3m, can not dry up, prone to failure!

（6）Electrode at the top of the glass ball on the dirt, available 0.1N hydrochloric acid cleaning, and then invade 3.3mKCL solution within the activation, do not touch. Long-term measure to ensure the correct electrode must be cleaned regularly to maintain and calibrate. Antimony electrode after use over time will produce oxidation, the electrode head black, the choice of fine sandpaper to polish the electrode head, will remove the oxidized part, to ensure sensitivity of the measurement electrodes.

（7）Maintain the electrode cable and connectors and other connectors clean and dry, not damp or water.

（8）Electrode failure or damage to be replaced. Recommend a replacement for one year.

10 Whole set

Name	Quantity
1）GE-132 pH Controller	1
2）pH or ORP electrode	1
3）pH buffer (without ORP electrode configuration)	1
4）Install bracket	2
5）User manual	1